

SEQUENCE LISTING

<110> Bartel, Paul L.
Tavtigian, Sean V.
Myriad Genetics, Inc.

<120> MMSC1 - An MMAC1 Interacting Protein

<130> MMSC1 Gene

<140>

<141>

<150> US 60/071,861

<151> 1998-01-20

<160> 65

<170> PatentIn Ver. 2.0

<210> 1

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:PDZ Consensus
Domain

<220>

<221> PEPTIDE

<222> (2)..(4)

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3 may be any amino acid; Xaa at residue 4 may be
Val or Ile.

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Glu Xaa Xaa Xaa

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<210> 2

<211> 5836

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

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Met
1

cct gaa aat cct gct aca gat aaa ctg cag gtg ctg cag gta ctt gat 165
Pro Glu Asn Pro Ala Thr Asp Lys Leu Gln Val Leu Gln Val Leu Asp
5 10 15

cgc ctg aaa atg aaa ttg cag gag aag ggt gac acg tcg cag aat gag 213
Arg Leu Lys Met Lys Leu Gln Glu Lys Gly Asp Thr Ser Gln Asn Glu
20 25 30

| | |
|---|-----|
| aag tta tct atg ttt tat gag aca cta aag agt cct ctc ttc aac cag | 261 |
| Lys Leu Ser Met Phe Tyr Glu Thr Leu Lys Ser Pro Leu Phe Asn Gln | |
| 35 40 45 | |
| ata ctc aca ctt cag cag tcc atc aag caa ctg aag ggt caa ctc aac | 309 |
| Ile Leu Thr Leu Gln Gln Ser Ile Lys Gln Leu Lys Gly Gln Leu Asn | |
| 50 55 60 65 | |
| cat ata ccc tca gat tgt tca gcc aac ttt gat ttt tct agg aaa ggt | 357 |
| His Ile Pro Ser Asp Cys Ser Ala Asn Phe Asp Phe Ser Arg Lys Gly | |
| 70 75 80 | |
| ttg tta gtg ttc aca gat ggt tcc att act aat gga aat gtc cac agg | 405 |
| Leu Leu Val Phe Thr Asp Gly Ser Ile Thr Asn Gly Asn Val His Arg | |
| 85 90 95 | |
| ccc tct aat aac tcg act gta tct ggg tta ttt ccg tgg acc ccg aag | 453 |
| Pro Ser Asn Asn Ser Thr Val Ser Gly Leu Phe Pro Trp Thr Pro Lys | |
| 100 105 110 | |
| ttg gga aat gaa gac ttt aac tca gtc att caa cag atg gct cag ggc | 501 |
| Leu Gly Asn Glu Asp Phe Asn Ser Val Ile Gln Gln Met Ala Gln Gly | |
| 115 120 125 | |
| cgg caa att gaa tat ata gat ata gaa cgg cct tca act gga ggc ctt | 549 |
| Arg Gln Ile Glu Tyr Ile Asp Ile Glu Arg Pro Ser Thr Gly Gly Leu | |
| 130 135 140 145 | |
| gga ttc agt gtg gtg gcc ctc aga agt caa aat ctc gga aaa gtt gat | 597 |
| Gly Phe Ser Val Val Ala Leu Arg Ser Gln Asn Leu Gly Lys Val Asp | |
| 150 155 160 | |
| atc ttc gtg aag gat gtc cag cca ggg agt gta gca gac agg gat caa | 645 |
| Ile Phe Val Lys Asp Val Gln Pro Gly Ser Val Ala Asp Arg Asp Gln | |
| 165 170 175 | |
| aga tta aag gaa aat gat caa ata ttg gcc att aat cac acg cca ttg | 693 |
| Arg Leu Lys Glu Asn Asp Gln Ile Leu Ala Ile Asn His Thr Pro Leu | |
| 180 185 190 | |
| gat cag aac att tcc cat cag caa gca att gca tta tta caa caa acc | 741 |
| Asp Gln Asn Ile Ser His Gln Gln Ala Ile Ala Leu Leu Gln Gln Thr | |
| 195 200 205 | |
| act gga tct ttg aga ctg att gtg gcc agg gaa cca gtc cac aca aaa | 789 |
| Thr Gly Ser Leu Arg Leu Ile Val Ala Arg Glu Pro Val His Thr Lys | |
| 210 215 220 225 | |
| agc agt act tct agc agc cta aat gat aca act ctg cct gaa aca gtt | 837 |
| Ser Ser Thr Ser Ser Ser Leu Asn Asp Thr Thr Leu Pro Glu Thr Val | |
| 230 235 240 | |
| tgt tgg ggc cat gtt gaa gag gtt gag ctc att aat gat ggc tct gga | 885 |
| Cys Trp Gly His Val Glu Glu Val Glu Leu Ile Asn Asp Gly Ser Gly | |
| 245 250 255 | |
| cta ggt ttt gga ata gtt gga gga aaa aca agt ggc gtg gtt gtg agg | 933 |
| Leu Gly Phe Gly Ile Val Gly Gly Lys Thr Ser Gly Val Val Val Arg | |
| 260 265 270 | |
| act ata gtt cct gga gga tta gca gat cga gat gga aga ctc cag aca | 981 |
| Thr Ile Val Pro Gly Gly Leu Ala Asp Arg Asp Gly Arg Leu Gln Thr | |
| 275 280 285 | |

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| ggg gac cac atc ttg aag att ggt ggc aca aac gtg cag gga atg acc | 1029 |
| Gly Asp His Ile Leu Lys Ile Gly Gly Thr Asn Val Gln Gly Met Thr | |
| 290 295 300 305 | |
| agt gag caa gtt gca caa gtt cta agg aac tgt ggg aat tca gtc agg | 1077 |
| Ser Glu Gln Val Ala Gln Val Leu Arg Asn Cys Gly Asn Ser Val Arg | |
| 310 315 320 | |
| atg ctc gtt gct aga gat cca gct ggt gac att tca gtc acc ccc cct | 1125 |
| Met Leu Val Ala Arg Asp Pro Ala Gly Asp Ile Ser Val Thr Pro Pro | |
| 325 330 335 | |
| gcc cct gca gcc tta cct gtt gcc ctg cct act gta gcc agc aag ggc | 1173 |
| Ala Pro Ala Ala Leu Pro Val Ala Leu Pro Thr Val Ala Ser Lys Gly | |
| 340 345 350 | |
| cct ggt tct gac agt tct ctt ttt gaa act tat aat gtt gag ctt gtg | 1221 |
| Pro Gly Ser Asp Ser Ser Leu Phe Glu Thr Tyr Asn Val Glu Leu Val | |
| 355 360 365 | |
| aga aaa gat ggg cag agt ctt gga att aga att gtt ggc tat gtt gga | 1269 |
| Arg Lys Asp Gly Gln Ser Leu Gly Ile Arg Ile Val Gly Tyr Val Gly | |
| 370 375 380 385 | |
| aca tct cat aca ggg gaa gct tca ggg att tat gtg aaa agt gta ata | 1317 |
| Thr Ser His Thr Gly Glu Ala Ser Gly Ile Tyr Val Lys Ser Val Ile | |
| 390 395 400 | |
| cct ggc agt gct gcg tac cac aat ggc cac att caa gtg aat gac aaa | 1365 |
| Pro Gly Ser Ala Ala Tyr His Asn Gly His Ile Gln Val Asn Asp Lys | |
| 405 410 415 | |
| ata gtt gct gtc gat ggc gtg aac att cag ggt ttt gcc aac cat gat | 1413 |
| Ile Val Ala Val Asp Gly Val Asn Ile Gln Gly Phe Ala Asn His Asp | |
| 420 425 430 | |
| gtt gtt gaa gta tta cga aat gca ggg cag gtg gta cac cta acc cta | 1461 |
| Val Val Glu Val Leu Arg Asn Ala Gly Gln Val Val His Leu Thr Leu | |
| 435 440 445 | |
| gtt cga agg aag aca tcc tca tct act tct cca ctt gaa cca cct tca | 1509 |
| Val Arg Arg Lys Thr Ser Ser Thr Ser Pro Leu Glu Pro Pro Ser | |
| 450 455 460 465 | |
| gac aga gga act gtt gta gaa cca ctg aaa cca cca gct ctc ttt cta | 1557 |
| Asp Arg Gly Thr Val Val Glu Pro Leu Lys Pro Pro Ala Leu Phe Leu | |
| 470 475 480 | |
| act gga gca gtg gaa act gaa act aat gtg gat ggt gaa gat gag gaa | 1605 |
| Thr Gly Ala Val Glu Thr Glu Thr Asn Val Asp Gly Glu Asp Glu Glu | |
| 485 490 495 | |
| att aaa gaa aga att gat act tta aaa aat gac aac ata caa gcc tta | 1653 |
| Ile Lys Glu Arg Ile Asp Thr Leu Lys Asn Asp Asn Ile Gln Ala Leu | |
| 500 505 510 | |
| gaa aaa ttg gaa aaa gtc cca gac tct cca gaa aat gag ctg aaa tcc | 1701 |
| Glu Lys Leu Glu Lys Val Pro Asp Ser Pro Glu Asn Glu Leu Lys Ser | |
| 515 520 525 | |
| aga tgg gaa aac ctg ttg ggt cct gat tat gaa gta atg gtt gct act | 1749 |
| Arg Trp Glu Asn Leu Leu Gly Pro Asp Tyr Glu Val Met Val Ala Thr | |
| 530 535 540 545 | |

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| ttg gac aca cag att gca gat gat gct gag tta cag aaa tat tca aag | 1797 |
| Leu Asp Thr Gln Ile Ala Asp Asp Ala Glu Leu Gln Lys Tyr Ser Lys | |
| 550 555 560 | |
| ctg ctg cct att cac act ctg agg ctt ggt gtg gaa gtg gat tcc ttt | 1845 |
| Leu Leu Pro Ile His Thr Leu Arg Leu Gly Val Glu Val Asp Ser Phe | |
| 565 570 575 | |
| gat ggg cac cat tat att tct tca att gtt tct ggt ggt cct gtt gat | 1893 |
| Asp Gly His His Tyr Ile Ser Ile Val Ser Gly Gly Pro Val Asp | |
| 580 585 590 | |
| aca ttg ggt ctc cta cag cca gaa gat gag ctg ctt gag gtc aat ggc | 1941 |
| Thr Leu Gly Leu Leu Gln Pro Glu Asp Glu Leu Leu Glu Val Asn Gly | |
| 595 600 605 | |
| atg cag ctt tat gga aaa tct cgc cga gaa gca gtc tcc ttt ctt aaa | 1989 |
| Met Gln Leu Tyr Gly Lys Ser Arg Arg Glu Ala Val Ser Phe Leu Lys | |
| 610 615 620 625 | |
| gaa gtg cca ccc cct ttt act ttg gtt tgc tgt cgg agg ttg ttt gat | 2037 |
| Glu Val Pro Pro Phe Thr Leu Val Cys Cys Arg Arg Leu Phe Asp | |
| 630 635 640 | |
| gat gaa gct tct gta gat gaa cca agg cgc act gaa acc tct ctt cct | 2085 |
| Asp Glu Ala Ser Val Asp Glu Pro Arg Arg Thr Glu Thr Ser Leu Pro | |
| 645 650 655 | |
| gag aca gag gtt gac cac aat atg gat gtc aat act gaa gaa gat gat | 2133 |
| Glu Thr Glu Val Asp His Asn Met Asp Val Asn Thr Glu Glu Asp Asp | |
| 660 665 670 | |
| gat ggg gaa tta gca ctg tgg tcc cct gaa gtc aag att gtt gaa cta | 2181 |
| Asp Gly Glu Leu Ala Leu Trp Ser Pro Glu Val Lys Ile Val Glu Leu | |
| 675 680 685 | |
| gta aaa gat tgt aaa ggt ttg gga ttc agc att ttg gat tac cag gac | 2229 |
| Val Lys Asp Cys Lys Gly Leu Gly Phe Ser Ile Leu Asp Tyr Gln Asp | |
| 690 695 700 705 | |
| cct tta gat cct aca aga tca gtg att gtg atc cgc tcc ctg gta gca | 2277 |
| Pro Leu Asp Pro Thr Arg Ser Val Ile Val Ile Arg Ser Leu Val Ala | |
| 710 715 720 | |
| gat ggt gta gca gaa aga agt ggg gga cta tta cct gga gac cgc ctg | 2325 |
| Asp Gly Val Ala Glu Arg Ser Gly Gly Leu Leu Pro Gly Asp Arg Leu | |
| 725 730 735 | |
| gtc tca gtc aat gaa tac tgt ttg gac aac acc tca ctt gct gaa gct | 2373 |
| Val Ser Val Asn Glu Tyr Cys Leu Asp Asn Thr Ser Leu Ala Glu Ala | |
| 740 745 750 | |
| gtg gaa ata ttg aaa gct gtg cca cca ggc cta gta cac ctt ggc atc | 2421 |
| Val Glu Ile Leu Lys Ala Val Pro Pro Gly Leu Val His Leu Gly Ile | |
| 755 760 765 | |
| tgt aag cct ttg gtg gaa gat aat gaa gaa gaa agt tgt tat att tta | 2469 |
| Cys Lys Pro Leu Val Glu Asp Asn Glu Glu Glu Ser Cys Tyr Ile Leu | |
| 770 775 780 785 | |
| cat tca agc agt aat gaa gac aag act gaa ttt tca gga aca att cat | 2517 |
| His Ser Ser Ser Asn Glu Asp Lys Thr Glu Phe Ser Gly Thr Ile His | |
| 790 795 800 | |

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|-----|------|-----|------|-----|------|-----|------|------|------|------|-----|------|------|------|-----|------|
| gat | ata | aat | tca | tct | tta | ata | ctc | gaa | gca | ccc | aag | gga | ttt | aga | gat | 2565 |
| Asp | Ile | Asn | Ser | Ser | Leu | Ile | Leu | Glu | Ala | Pro | Lys | Gly | Phe | Arg | Asp | |
| | | | 805 | | | | | 810 | | | | | 815 | | | |
| gaa | cca | tat | ttt | aaa | gaa | gaa | ctt | gtg | gat | gaa | cca | ttt | cta | gat | ctg | 2613 |
| Glu | Pro | Tyr | Phe | Lys | Glu | Glu | Leu | Val | Asp | Glu | Pro | Phe | Leu | Asp | Leu | |
| | | 820 | | | | | 825 | | | | | 830 | | | | |
| gga | aag | tct | ttc | cat | tcc | caa | caa | aaa | gag | ata | gag | caa | agc | aag | gag | 2661 |
| Gly | Lys | Ser | Phe | His | Ser | Gln | Gln | Lys | Glu | Ile | Glu | Gln | Ser | Lys | Glu | |
| | 835 | | | | | 840 | | | | | 845 | | | | | |
| gcc | tgg | gag | atg | cat | gaa | ttt | ctg | act | cct | aga | ttg | cag | gaa | atg | gat | 2709 |
| Ala | Trp | Glu | Met | His | Glu | Phe | Leu | Thr | Pro | Arg | Leu | Gln | Glu | Met | Asp | |
| | 850 | | | | 855 | | | | | 860 | | | | | 865 | |
| gaa | gaa | aga | gaa | atg | ctt | gtt | gat | gaa | gaa | tat | gag | tta | tat | caa | gat | 2757 |
| Glu | Glu | Arg | Glu | Met | Leu | Val | Asp | Glu | Glu | Tyr | Glu | Leu | Tyr | Gln | Asp | |
| | | | | 870 | | | | | 875 | | | | | 880 | | |
| ccc | tca | cca | tcc | atg | gag | ttg | tat | ccc | ttg | tcg | cac | att | caa | gag | gcc | 2805 |
| Pro | Ser | Pro | Ser | Met | Glu | Leu | Tyr | Pro | Leu | Ser | His | Ile | Gln | Glu | Ala | |
| | | | 885 | | | | | 890 | | | | | 895 | | | |
| act | cct | gtg | ccc | tct | gtg | aat | gaa | ctt | cac | ttt | ggt | aca | cag | tggt | ttg | 2853 |
| Thr | Pro | Val | Pro | Ser | Val | Asn | Glu | Leu | His | Phe | Gly | Thr | Gln | Trp | Leu | |
| | | 900 | | | | 905 | | | | | | 910 | | | | |
| cat | gat | aat | gaa | cca | tcc | gag | tct | caa | gag | gca | aga | acc | ggg | agg | act | 2901 |
| His | Asp | Asn | Glu | Pro | Ser | Glu | Ser | Gln | Glu | Ala | Arg | Thr | Gly | Arg | Thr | |
| | 915 | | | | | 920 | | | | | 925 | | | | | |
| gtc | tat | tcc | cag | gag | gca | cag | ccg | tat | ggc | tat | tgc | cct | gaa | aat | gtg | 2949 |
| Val | Tyr | Ser | Gln | Glu | Ala | Gln | Pro | Tyr | Gly | Tyr | Cys | Pro | Glu | Asn | Val | |
| | 930 | | | | 935 | | | | 940 | | | | | | 945 | |
| atg | aaa | gaa | aat | ttt | gtc | atg | gag | tcc | cta | cca | tct | gta | cca | tca | act | 2997 |
| Met | Lys | Glu | Asn | Phe | Val | Met | Glu | Ser | Leu | Pro | Ser | Val | Pro | Ser | Thr | |
| | | | | 950 | | | | | 955 | | | | | 960 | | |
| gaa | gga | aac | agt | caa | caa | ggc | aga | ttt | gac | gac | ctg | gaa | aat | ctt | aat | 3045 |
| Glu | Gly | Asn | Ser | Gln | Gln | Gly | Arg | Phe | Asp | Asp | Leu | Glu | Asn | Leu | Asn | |
| | | | 965 | | | | | 970 | | | | | 975 | | | |
| tca | tta | gca | aaa | act | agt | ctg | gat | tta | ggc | atg | atc | ccg | aat | gat | gtc | 3093 |
| Ser | Leu | Ala | Lys | Thr | Ser | Leu | Asp | Leu | Gly | Met | Ile | Pro | Asn | Asp | Val | |
| | | 980 | | | | | 985 | | | | | 990 | | | | |
| caa | ggt | cct | agc | ttg | ctc | att | gac | ctt | cct | gtt | gtg | gct | caa | agg | agg | 3141 |
| Gln | Gly | Pro | Ser | Leu | Leu | Ile | Asp | Leu | Pro | Val | Val | Ala | Gln | Arg | Arg | |
| | 995 | | | | 1000 | | | | | 1005 | | | | | | |
| gag | caa | gaa | gat | ttg | cct | tta | tat | caa | cac | caa | gcg | aca | cga | gtt | att | 3189 |
| Glu | Gln | Glu | Asp | Leu | Pro | Leu | Tyr | Gln | His | Gln | Ala | Thr | Arg | Val | Ile | |
| | 1010 | | | | 1015 | | | | 1020 | | | | | 1025 | | |
| tcc | aag | gcc | tca | gca | tac | aca | gga | atg | ttg | tct | tct | aga | tat | gcc | act | 3237 |
| Ser | Lys | Ala | Ser | Ala | Tyr | Thr | Gly | Met | Leu | Ser | Ser | Arg | Tyr | Ala | Thr | |
| | | | 1030 | | | | | 1035 | | | | | 1040 | | | |
| gat | aca | tgt | gag | tta | cct | gag | aga | gaa | gaa | ggc | gaa | gga | gaa | gaa | act | 3285 |
| Asp | Thr | Cys | Glu | Leu | Pro | Glu | Arg | Glu | Glu | Gly | Glu | Gly | Glu | Glu | Thr | |
| | | | 1045 | | | | 1050 | | | | | 1055 | | | | |

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|---|------|
| cca aat ttt agc cac tgg ggt cca ccg aga att gtt gag att ttt aga | 3333 |
| Pro Asn Phe Ser His Trp Gly Pro Pro Arg Ile Val Glu Ile Phe Arg | |
| 1060 1065 1070 | |
| gaa ccc aat gtg tct ctt ggg atc agt att gtt ggt gga caa act gtt | 3381 |
| Glu Pro Asn Val Ser Leu Gly Ile Ser Ile Val Gly Gly Gln Thr Val | |
| 1075 1080 1085 | |
| ata aaa cgt cta aag aat gga gag gag ctt aaa ggt ata ttc atc aaa | 3429 |
| Ile Lys Arg Leu Lys Asn Gly Glu Glu Leu Lys Gly Ile Phe Ile Lys | |
| 1090 1095 1100 1105 | |
| caa gtt tta gaa gac agt cca gca ggg aag acg aac gca ctt aaa act | 3477 |
| Gln Val Leu Glu Asp Ser Pro Ala Gly Lys Thr Asn Ala Leu Lys Thr | |
| 1110 1115 1120 | |
| gga gat aaa ata ctt gag gtg tct gga gta gat ttg cag aat gcc tca | 3525 |
| Gly Asp Lys Ile Leu Glu Val Ser Gly Val Asp Leu Gln Asn Ala Ser | |
| 1125 1130 1135 | |
| cac agc gaa gca gtt gag gcc att aag aat gca gga aac cct gtg gtg | 3573 |
| His Ser Glu Ala Val Glu Ala Ile Lys Asn Ala Gly Asn Pro Val Val | |
| 1140 1145 1150 | |
| ttc att gtt cag agt ttg tca tcc act cca cga gtc att cct aat gta | 3621 |
| Phe Ile Val Gln Ser Leu Ser Ser Thr Pro Arg Val Ile Pro Asn Val | |
| 1155 1160 1165 | |
| cat aac aag gcc aac aaa atc acc agt aac cag aac cag gac acc caa | 3669 |
| His Asn Lys Ala Asn Lys Ile Thr Ser Asn Gln Asn Gln Asp Thr Gln | |
| 1170 1175 1180 1185 | |
| gaa aag aaa gaa aag agg caa gga act gct cca ccg cca atg aaa ctt | 3717 |
| Glu Lys Lys Glu Lys Arg Gln Gly Thr Ala Pro Pro Pro Met Lys Leu | |
| 1190 1195 1200 | |
| cct cct cct tat aaa gct ctg act gat gac agt gat gaa aat gaa gaa | 3765 |
| Pro Pro Pro Tyr Lys Ala Leu Thr Asp Asp Ser Asp Glu Asn Glu Glu | |
| 1205 1210 1215 | |
| gaa gat gcc ttt acc gac caa aaa atc aga caa aga tat gca gat ctg | 3813 |
| Glu Asp Ala Phe Thr Asp Gln Lys Ile Arg Gln Arg Tyr Ala Asp Leu | |
| 1220 1225 1230 | |
| cct gga gaa ctg cac att att gaa ctt gaa aaa gat aag aat gga ctt | 3861 |
| Pro Gly Glu Leu His Ile Ile Glu Leu Glu Lys Asp Lys Asn Gly Leu | |
| 1235 1240 1245 | |
| gga ctc agc ctt gct ggt aat aaa gac cga tca cgc atg agc ata ttt | 3909 |
| Gly Leu Ser Leu Ala Gly Asn Lys Asp Arg Ser Arg Met Ser Ile Phe | |
| 1250 1255 1260 1265 | |
| gtg gtg gga att aac ccg gaa gga cct gct gcc gca gat gga cga atg | 3957 |
| Val Val Gly Ile Asn Pro Glu Gly Pro Ala Ala Ala Asp Gly Arg Met | |
| 1270 1275 1280 | |
| cat att gga gat gaa ctc tta gag ata aac aat cag att ctg tat gga | 4005 |
| His Ile Gly Asp Glu Leu Leu Glu Ile Asn Asn Gln Ile Leu Tyr Gly | |
| 1285 1290 1295 | |
| aga agt cac caa aat gca tct gcc att att aag act gcc cca tca aag | 4053 |
| Arg Ser His Gln Asn Ala Ser Ala Ile Ile Lys Thr Ala Pro Ser Lys | |
| 1300 1305 1310 | |

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|---|------|
| gtc aag ctg gtt ttc atc aga aac gag gat gca gtc aat cag atg gcc Val Lys Leu Val Phe Ile Arg Asn Glu Asp Ala Val Asn Gln Met Ala 1315 1320 1325 | 4101 |
| gtt act ccc ttt cca gtg cca tca agt tct cca tct tct att gag gat Val Thr Pro Phe Pro Val Pro Ser Ser Ser Pro Ser Ser Ile Glu Asp 1330 1335 1340 1345 | 4149 |
| cag agc ggc acc gaa cct att agt agt gag gaa gat ggc agc ctc gaa Gln Ser Gly Thr Glu Pro Ile Ser Ser Glu Glu Asp Gly Ser Leu Glu 1350 1355 1360 | 4197 |
| gtt ggt att aaa caa ttg cct gaa agt gaa agc ttc aaa ctg gct gtc Val Gly Ile Lys Gln Leu Pro Glu Ser Glu Ser Phe Lys Leu Ala Val 1365 1370 1375 | 4245 |
| agc cag atg aaa cag caa aaa tat cca aca aaa gtc tcc ttc agt tca Ser Gln Met Lys Gln Gln Lys Tyr Pro Thr Lys Val Ser Phe Ser Ser 1380 1385 1390 | 4293 |
| caa gag ata cca tta gca cca gct tca tca tac cat tca aca gat gca Gln Glu Ile Pro Leu Ala Pro Ala Ser Ser Tyr His Ser Thr Asp Ala 1395 1400 1405 | 4341 |
| gac ttc aca ggc tat ggt ggt ttc cag gct cct ctg tca gtg gac ccc Asp Phe Thr Gly Tyr Gly Gly Phe Gln Ala Pro Leu Ser Val Asp Pro 1410 1415 1420 1425 | 4389 |
| gca acg tgt ccc att gtc cct gga cag gaa atg att ata gaa ata tcc Ala Thr Cys Pro Ile Val Pro Gly Gln Glu Met Ile Ile Glu Ile Ser 1430 1435 1440 | 4437 |
| aag gga cgt tca ggg ctt ggt ctc agc att gtg gga gga aaa gac aca Lys Gly Arg Ser Gly Leu Gly Leu Ser Ile Val Gly Gly Lys Asp Thr 1445 1450 1455 | 4485 |
| ccc ttg aat gct ata gtt atc cat gaa gtc tat gaa gaa ggg gca gca Pro Leu Asn Ala Ile Val Ile His Glu Val Tyr Glu Glu Gly Ala Ala 1460 1465 1470 | 4533 |
| gcc aga gat gga aga ctt tgg gct ggt gac cag ata tta gag gtt aat Ala Arg Asp Gly Arg Leu Trp Ala Gly Asp Gln Ile Leu Glu Val Asn 1475 1480 1485 | 4581 |
| ggg gtt gac ctg agg aac tcc agc cac gaa gaa gcc atc aca gcc ctg Gly Val Asp Leu Arg Asn Ser Ser His Glu Glu Ala Ile Thr Ala Leu 1490 1495 1500 1505 | 4629 |
| agg cag acc ccc cag aag gtg cgg ctg gtg gtg tat aga gat gaa gca Arg Gln Thr Pro Gln Lys Val Arg Leu Val Val Tyr Arg Asp Glu Ala 1510 1515 1520 | 4677 |
| cac tac cgg gat gag gag aac ttg gag att ttc cct gtg gat ctg cag His Tyr Arg Asp Glu Glu Asn Leu Glu Ile Phe Pro Val Asp Leu Gln 1525 1530 1535 | 4725 |
| aag aaa gct ggc cgg ggc ctg ggc ctg agc atc gtt ggg aaa cga aat Lys Lys Ala Gly Arg Gly Leu Gly Leu Ser Ile Val Gly Lys Arg Asn 1540 1545 1550 | 4773 |
| gga agc gga gtg ttt att tct gac atc gtg aaa ggc gga gcc gca gac Gly Ser Gly Val Phe Ile Ser Asp Ile Val Lys Gly Gly Ala Ala Asp 1555 1560 1565 | 4821 |

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|---|------|
| ctg gat ggg aga ttg att cag gga gat cag atc tta tct gtg aat ggg Leu Asp Gly Arg Leu Ile Gln Gly Asp Gln Ile Leu Ser Val Asn Gly 1570 1575 1580 1585 | 4869 |
| gag gac atg aga aat gcc tca cag gag aca gtg gcc acc atc ctc aag Glu Asp Met Arg Asn Ala Ser Gln Glu Thr Val Ala Thr Ile Leu Lys 1590 1595 1600 | 4917 |
| tgt gca cag gga ctt gtg cag cta gag att gga aga ctc cga gct ggt Cys Ala Gln Gly Leu Val Gln Leu Glu Ile Gly Arg Leu Arg Ala Gly 1605 1610 1615 | 4965 |
| tcc tgg acc tcc gca agg acg aca tca cag aac agt cag ggt agt cag Ser Trp Thr Ser Ala Arg Thr Thr Ser Gln Asn Ser Gln Gly Ser Gln 1620 1625 1630 | 5013 |
| cag agt gca cac agc agc tgt cat ccc tcc ttc gct cct gtc atc act Gln Ser Ala His Ser Ser Cys His Pro Ser Phe Ala Pro Val Ile Thr 1635 1640 1645 | 5061 |
| ggc ctg caa aac ctg gtt ggc aca aaa aga gtt tca gat cct tcc cag Gly Leu Gln Asn Leu Val Gly Thr Lys Arg Val Ser Asp Pro Ser Gln 1650 1655 1660 1665 | 5109 |
| aaa aat tca ggc aca gat atg gaa cca agg act gtt gag ata aac agg Lys Asn Ser Gly Thr Asp Met Glu Pro Arg Thr Val Glu Ile Asn Arg 1670 1675 1680 | 5157 |
| gag ctc agt gat gcc ctt gga atc agt att gct gga gga aga gga agt Glu Leu Ser Asp Ala Leu Gly Ile Ser Ile Ala Gly Gly Arg Gly Ser 1685 1690 1695 | 5205 |
| ccc tta gga gat atc ccc gta ttt att gcc atg att cag gct agc gga Pro Leu Gly Asp Ile Pro Val Phe Ile Ala Met Ile Gln Ala Ser Gly 1700 1705 1710 | 5253 |
| gtg gcc gca cgg aca cag aag ctt aaa gtt gga gat cgg att gtc agc Val Ala Ala Arg Thr Gln Lys Leu Lys Val Gly Asp Arg Ile Val Ser 1715 1720 1725 | 5301 |
| att aac ggg caa cct ttg gat ggg ctg tct cac gcg gat gtg gtt aat Ile Asn Gly Gln Pro Leu Asp Gly Leu Ser His Ala Asp Val Val Asn 1730 1735 1740 1745 | 5349 |
| ctg ctg aag aat gcc tac ggg cgc att atc ctg cag gtt gta gca gat Leu Leu Lys Asn Ala Tyr Gly Arg Ile Ile Leu Gln Val Val Ala Asp 1750 1755 1760 | 5397 |
| acc aat ata agc gcc ata gca gct cag ctt gaa aac atg tct aca gcc Thr Asn Ile Ser Ala Ile Ala Ala Gln Leu Glu Asn Met Ser Thr Gly 1765 1770 1775 | 5445 |
| tac cac ctt ggt tgc ccc act gct gaa cac cat cca gaa gac aca gaa Tyr His Leu Gly Ser Pro Thr Ala Glu His His Pro Glu Asp Thr Glu 1780 1785 1790 | 5493 |
| aca cct cca cct aag att att act ttg gag aaa ggc tct gaa ggc ttg Thr Pro Pro Pro Lys Ile Ile Thr Leu Glu Lys Gly Ser Glu Gly Leu 1795 1800 1805 | 5541 |
| ggg ttt agt att gta ggg ggt tat gga agt ccc cat gga gac ctg cca Gly Phe Ser Ile Val Gly Gly Tyr Gly Ser Pro His Gly Asp Leu Pro 1810 1815 1820 1825 | 5589 |

att tat gtc aag act gta ttt gca aag gga gca gct gca gat gac ggc 5637
Ile Tyr Val Lys Thr Val Phe Ala Lys Gly Ala Ala Ala Asp Asp Gly
1830 1835 1840

cga tta aaa cga ggg gat cag att tta gct gtt aat ggc gag acc ctg 5685
Arg Leu Lys Arg Gly Asp Gln Ile Leu Ala Val Asn Gly Glu Thr Leu
1845 1850 1855

gaa ggt gtt act cat gag caa gca gtc gcc att cta aaa cac cag aga 5733
Glu Gly Val Thr His Glu Gln Ala Val Ala Ile Leu Lys His Gln Arg
1860 1865 1870

ggg act gta acc tta act gtg ctg tcatgagcct cgggcctgat cacaagatag 5787
Gly Thr Val Thr Leu Thr Val Leu
1875 1880

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<213> Homo sapiens

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Glu Lys Leu Ser Met Phe Tyr Glu Thr Leu Lys Ser Pro Leu Phe Asn
35 40 45

Gln Ile Leu Thr Leu Gln Gln Ser Ile Lys Gln Leu Lys Gly Gln Leu
50 55 60

Asn His Ile Pro Ser Asp Cys Ser Ala Asn Phe Asp Phe Ser Arg Lys
65 70 75 80

Gly Leu Leu Val Phe Thr Asp Gly Ser Ile Thr Asn Gly Asn Val His
85 90 95

Arg Pro Ser Asn Asn Ser Thr Val Ser Gly Leu Phe Pro Trp Thr Pro
100 105 110

Lys Leu Gly Asn Glu Asp Phe Asn Ser Val Ile Gln Gln Met Ala Gln
115 120 125

Gly Arg Gln Ile Glu Tyr Ile Asp Ile Glu Arg Pro Ser Thr Gly Gly
130 135 140

Leu Gly Phe Ser Val Val Ala Leu Arg Ser Gln Asn Leu Gly Lys Val
145 150 155 160

Asp Ile Phe Val Lys Asp Val Gln Pro Gly Ser Val Ala Asp Arg Asp
165 170 175

Gln Arg Leu Lys Glu Asn Asp Gln Ile Leu Ala Ile Asn His Thr Pro
180 185 190

Leu Asp Gln Asn Ile Ser His Gln Gln Ala Ile Ala Leu Leu Gln Gln
195 200 205

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Thr | Gly | Ser | Leu | Arg | Leu | Ile | Val | Ala | Arg | Glu | Pro | Val | His | Thr |
| 210 | | | | | | 215 | | | | | 220 | | | | |
| Lys | Ser | Ser | Thr | Ser | Ser | Ser | Leu | Asn | Asp | Thr | Thr | Leu | Pro | Glu | Thr |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Val | Cys | Trp | Gly | His | Val | Glu | Glu | Val | Glu | Leu | Ile | Asn | Asp | Gly | Ser |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Gly | Leu | Gly | Phe | Gly | Ile | Val | Gly | Gly | Lys | Thr | Ser | Gly | Val | Val | Val |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Arg | Thr | Ile | Val | Pro | Gly | Gly | Leu | Ala | Asp | Arg | Asp | Gly | Arg | Leu | Gln |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Thr | Gly | Asp | His | Ile | Leu | Lys | Ile | Gly | Gly | Thr | Asn | Val | Gln | Gly | Met |
| 290 | | | | | | 295 | | | | | 300 | | | | |
| Thr | Ser | Glu | Gln | Val | Ala | Gln | Val | Leu | Arg | Asn | Cys | Gly | Asn | Ser | Val |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 |
| Arg | Met | Leu | Val | Ala | Arg | Asp | Pro | Ala | Gly | Asp | Ile | Ser | Val | Thr | Pro |
| | | | | 325 | | | | | 330 | | | | | 335 | |
| Pro | Ala | Pro | Ala | Ala | Leu | Pro | Val | Ala | Leu | Pro | Thr | Val | Ala | Ser | Lys |
| | | | | 340 | | | | 345 | | | | | 350 | | |
| Gly | Pro | Gly | Ser | Asp | Ser | Ser | Leu | Phe | Glu | Thr | Tyr | Asn | Val | Glu | Leu |
| | | 355 | | | | | 360 | | | | | 365 | | | |
| Val | Arg | Lys | Asp | Gly | Gln | Ser | Leu | Gly | Ile | Arg | Ile | Val | Gly | Tyr | Val |
| 370 | | | | | | 375 | | | | | 380 | | | | |
| Gly | Thr | Ser | His | Thr | Gly | Glu | Ala | Ser | Gly | Ile | Tyr | Val | Lys | Ser | Val |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 |
| Ile | Pro | Gly | Ser | Ala | Ala | Tyr | His | Asn | Gly | His | Ile | Gln | Val | Asn | Asp |
| | | | | 405 | | | | | 410 | | | | | 415 | |
| Lys | Ile | Val | Ala | Val | Asp | Gly | Val | Asn | Ile | Gln | Gly | Phe | Ala | Asn | His |
| | | | 420 | | | | | 425 | | | | | 430 | | |
| Asp | Val | Val | Glu | Val | Leu | Arg | Asn | Ala | Gly | Gln | Val | Val | His | Leu | Thr |
| | | 435 | | | | | 440 | | | | | 445 | | | |
| Leu | Val | Arg | Arg | Lys | Thr | Ser | Ser | Ser | Thr | Ser | Pro | Leu | Glu | Pro | Pro |
| 450 | | | | | | 455 | | | | | 460 | | | | |
| Ser | Asp | Arg | Gly | Thr | Val | Val | Glu | Pro | Leu | Lys | Pro | Pro | Ala | Leu | Phe |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 |
| Leu | Thr | Gly | Ala | Val | Glu | Thr | Glu | Thr | Asn | Val | Asp | Gly | Glu | Asp | Glu |
| | | | | 485 | | | | 490 | | | | | | 495 | |
| Glu | Ile | Lys | Glu | Arg | Ile | Asp | Thr | Leu | Lys | Asn | Asp | Asn | Ile | Gln | Ala |
| | | | 500 | | | | | 505 | | | | | 510 | | |
| Leu | Glu | Lys | Leu | Glu | Lys | Val | Pro | Asp | Ser | Pro | Glu | Asn | Glu | Leu | Lys |
| | | 515 | | | | | 520 | | | | | 525 | | | |
| Ser | Arg | Trp | Glu | Asn | Leu | Leu | Gly | Pro | Asp | Tyr | Glu | Val | Met | Val | Ala |
| 530 | | | | | | 535 | | | | | 540 | | | | |

| | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Leu | Asp | Thr | Gln | Ile | Ala | Asp | Asp | Ala | Glu | Leu | Gln | Lys | Tyr | Ser | 545 | 550 | 555 | 560 |
| Lys | Leu | Leu | Pro | Ile | His | Thr | Leu | Arg | Leu | Gly | Val | Glu | Val | Asp | Ser | 565 | 570 | 575 | |
| Phe | Asp | Gly | His | His | Tyr | Ile | Ser | Ser | Ile | Val | Ser | Gly | Gly | Pro | Val | 580 | 585 | 590 | |
| Asp | Thr | Leu | Gly | Leu | Leu | Gln | Pro | Glu | Asp | Glu | Leu | Leu | Glu | Val | Asn | 595 | 600 | 605 | |
| Gly | Met | Gln | Leu | Tyr | Gly | Lys | Ser | Arg | Arg | Glu | Ala | Val | Ser | Phe | Leu | 610 | 615 | 620 | |
| Lys | Glu | Val | Pro | Pro | Pro | Phe | Thr | Leu | Val | Cys | Cys | Arg | Arg | Leu | Phe | 625 | 630 | 635 | 640 |
| Asp | Asp | Glu | Ala | Ser | Val | Asp | Glu | Pro | Arg | Arg | Thr | Glu | Thr | Ser | Leu | 645 | 650 | 655 | |
| Pro | Glu | Thr | Glu | Val | Asp | His | Asn | Met | Asp | Val | Asn | Thr | Glu | Glu | Asp | 660 | 665 | 670 | |
| Asp | Asp | Gly | Glu | Leu | Ala | Leu | Trp | Ser | Pro | Glu | Val | Lys | Ile | Val | Glu | 675 | 680 | 685 | |
| Leu | Val | Lys | Asp | Cys | Lys | Gly | Leu | Gly | Phe | Ser | Ile | Leu | Asp | Tyr | Gln | 690 | 695 | 700 | |
| Asp | Pro | Leu | Asp | Pro | Thr | Arg | Ser | Val | Ile | Val | Ile | Arg | Ser | Leu | Val | 705 | 710 | 715 | 720 |
| Ala | Asp | Gly | Val | Ala | Glu | Arg | Ser | Gly | Gly | Leu | Leu | Pro | Gly | Asp | Arg | 725 | 730 | 735 | |
| Leu | Val | Ser | Val | Asn | Glu | Tyr | Cys | Leu | Asp | Asn | Thr | Ser | Leu | Ala | Glu | 740 | 745 | 750 | |
| Ala | Val | Glu | Ile | Leu | Lys | Ala | Val | Pro | Pro | Gly | Leu | Val | His | Leu | Gly | 755 | 760 | 765 | |
| Ile | Cys | Lys | Pro | Leu | Val | Glu | Asp | Asn | Glu | Glu | Glu | Ser | Cys | Tyr | Ile | 770 | 775 | 780 | |
| Leu | His | Ser | Ser | Ser | Asn | Glu | Asp | Lys | Thr | Glu | Phe | Ser | Gly | Thr | Ile | 785 | 790 | 795 | 800 |
| His | Asp | Ile | Asn | Ser | Ser | Leu | Ile | Leu | Glu | Ala | Pro | Lys | Gly | Phe | Arg | 805 | 810 | 815 | |
| Asp | Glu | Pro | Tyr | Phe | Lys | Glu | Glu | Leu | Val | Asp | Glu | Pro | Phe | Leu | Asp | 820 | 825 | 830 | |
| Leu | Gly | Lys | Ser | Phe | His | Ser | Gln | Gln | Lys | Glu | Ile | Glu | Gln | Ser | Lys | 835 | 840 | 845 | |
| Glu | Ala | Trp | Glu | Met | His | Glu | Phe | Leu | Thr | Pro | Arg | Leu | Gln | Glu | Met | 850 | 855 | 860 | |
| Asp | Glu | Glu | Arg | Glu | Met | Leu | Val | Asp | Glu | Glu | Tyr | Glu | Leu | Tyr | Gln | 865 | 870 | 875 | 880 |

Asp Pro Ser Pro Ser Met Glu Leu Tyr Pro Leu Ser His Ile Gln Glu
885 890 895

Ala Thr Pro Val Pro Ser Val Asn Glu Leu His Phe Gly Thr Gln Trp
900 905 910

Leu His Asp Asn Glu Pro Ser Glu Ser Gln Glu Ala Arg Thr Gly Arg
915 920 925

Thr Val Tyr Ser Gln Glu Ala Gln Pro Tyr Gly Tyr Cys Pro Glu Asn
930 935 940

Val Met Lys Glu Asn Phe Val Met Glu Ser Leu Pro Ser Val Pro Ser
945 950 955 960

Thr Glu Gly Asn Ser Gln Gln Gly Arg Phe Asp Asp Leu Glu Asn Leu
965 970 975

Asn Ser Leu Ala Lys Thr Ser Leu Asp Leu Gly Met Ile Pro Asn Asp
980 985 990

Val Gln Gly Pro Ser Leu Leu Ile Asp Leu Pro Val Val Ala Gln Arg
995 1000 1005

Arg Glu Gln Glu Asp Leu Pro Leu Tyr Gln His Gln Ala Thr Arg Val
1010 1015 1020

Ile Ser Lys Ala Ser Ala Tyr Thr Gly Met Leu Ser Ser Arg Tyr Ala
1025 1030 1035 1040

Thr Asp Thr Cys Glu Leu Pro Glu Arg Glu Glu Gly Glu Gly Glu Glu
1045 1050 1055

Thr Pro Asn Phe Ser His Trp Gly Pro Pro Arg Ile Val Glu Ile Phe
1060 1065 1070

Arg Glu Pro Asn Val Ser Leu Gly Ile Ser Ile Val Gly Gly Gln Thr
1075 1080 1085

Val Ile Lys Arg Leu Lys Asn Gly Glu Glu Leu Lys Gly Ile Phe Ile
1090 1095 1100

Lys Gln Val Leu Glu Asp Ser Pro Ala Gly Lys Thr Asn Ala Leu Lys
1105 1110 1115 1120

Thr Gly Asp Lys Ile Leu Glu Val Ser Gly Val Asp Leu Gln Asn Ala
1125 1130 1135

Ser His Ser Glu Ala Val Glu Ala Ile Lys Asn Ala Gly Asn Pro Val
1140 1145 1150

Val Phe Ile Val Gln Ser Leu Ser Ser Thr Pro Arg Val Ile Pro Asn
1155 1160 1165

Val His Asn Lys Ala Asn Lys Ile Thr Ser Asn Gln Asn Gln Asp Thr
1170 1175 1180

Gln Glu Lys Lys Glu Lys Arg Gln Gly Thr Ala Pro Pro Pro Met Lys
1185 1190 1195 1200

Leu Pro Pro Pro Tyr Lys Ala Leu Thr Asp Asp Ser Asp Glu Asn Glu
1205 1210 1215

Glu Glu Asp Ala Phe Thr Asp Gln Lys Ile Arg Gln Arg Tyr Ala Asp
1220 1225 1230

Leu Pro Gly Glu Leu His Ile Ile Glu Leu Glu Lys Asp Lys Asn Gly
1235 1240 1245

Leu Gly Leu Ser Leu Ala Gly Asn Lys Asp Arg Ser Arg Met Ser Ile
1250 1255 1260

Phe Val Val Gly Ile Asn Pro Glu Gly Pro Ala Ala Ala Asp Gly Arg
265 1270 1275 1280

Met His Ile Gly Asp Glu Leu Leu Glu Ile Asn Asn Gln Ile Leu Tyr
1285 1290 1295

Gly Arg Ser His Gln Asn Ala Ser Ala Ile Ile Lys Thr Ala Pro Ser
1300 1305 1310

Lys Val Lys Leu Val Phe Ile Arg Asn Glu Asp Ala Val Asn Gln Met
1315 1320 1325

Ala Val Thr Pro Phe Pro Val Pro Ser Ser Ser Pro Ser Ser Ile Glu
1330 1335 1340

Asp Gln Ser Gly Thr Glu Pro Ile Ser Ser Glu Glu Asp Gly Ser Leu
345 1350 1355 1360

Glu Val Gly Ile Lys Gln Leu Pro Glu Ser Glu Ser Phe Lys Leu Ala
1365 1370 1375

Val Ser Gln Met Lys Gln Gln Lys Tyr Pro Thr Lys Val Ser Phe Ser
1380 1385 1390

Ser Gln Glu Ile Pro Leu Ala Pro Ala Ser Ser Tyr His Ser Thr Asp
1395 1400 1405

Ala Asp Phe Thr Gly Tyr Gly Gly Phe Gln Ala Pro Leu Ser Val Asp
1410 1415 1420

Pro Ala Thr Cys Pro Ile Val Pro Gly Gln Glu Met Ile Ile Glu Ile
425 1430 1435 1440

Ser Lys Gly Arg Ser Gly Leu Gly Leu Ser Ile Val Gly Gly Lys Asp
1445 1450 1455

Thr Pro Leu Asn Ala Ile Val Ile His Glu Val Tyr Glu Glu Gly Ala
1460 1465 1470

Ala Ala Arg Asp Gly Arg Leu Trp Ala Gly Asp Gln Ile Leu Glu Val
1475 1480 1485

Asn Gly Val Asp Leu Arg Asn Ser Ser His Glu Glu Ala Ile Thr Ala
1490 1495 1500

Leu Arg Gln Thr Pro Gln Lys Val Arg Leu Val Val Tyr Arg Asp Glu
505 1510 1515 1520

Ala His Tyr Arg Asp Glu Glu Asn Leu Glu Ile Phe Pro Val Asp Leu
1525 1530 1535

Gln Lys Lys Ala Gly Arg Gly Leu Gly Leu Ser Ile Val Gly Lys Arg
1540 1545 1550

Asn Gly Ser Gly Val Phe Ile Ser Asp Ile Val Lys Gly Gly Ala Ala
1555 1560 1565

Asp Leu Asp Gly Arg Leu Ile Gln Gly Asp Gln Ile Leu Ser Val Asn
1570 1575 1580

Gly Glu Asp Met Arg Asn Ala Ser Gln Glu Thr Val Ala Thr Ile Leu
585 1590 1595 1600

Lys Cys Ala Gln Gly Leu Val Gln Leu Glu Ile Gly Arg Leu Arg Ala
1605 1610 1615

Gly Ser Trp Thr Ser Ala Arg Thr Thr Ser Gln Asn Ser Gln Gly Ser
1620 1625 1630

Gln Gln Ser Ala His Ser Ser Cys His Pro Ser Phe Ala Pro Val Ile
1635 1640 1645

Thr Gly Leu Gln Asn Leu Val Gly Thr Lys Arg Val Ser Asp Pro Ser
1650 1655 1660

Gln Lys Asn Ser Gly Thr Asp Met Glu Pro Arg Thr Val Glu Ile Asn
665 1670 1675 1680

Arg Glu Leu Ser Asp Ala Leu Gly Ile Ser Ile Ala Gly Gly Arg Gly
1685 1690 1695

Ser Pro Leu Gly Asp Ile Pro Val Phe Ile Ala Met Ile Gln Ala Ser
1700 1705 1710

Gly Val Ala Ala Arg Thr Gln Lys Leu Lys Val Gly Asp Arg Ile Val
1715 1720 1725

Ser Ile Asn Gly Gln Pro Leu Asp Gly Leu Ser His Ala Asp Val Val
1730 1735 1740

Asn Leu Leu Lys Asn Ala Tyr Gly Arg Ile Ile Leu Gln Val Val Ala
745 1750 1755 1760

Asp Thr Asn Ile Ser Ala Ile Ala Ala Gln Leu Glu Asn Met Ser Thr
1765 1770 1775

Gly Tyr His Leu Gly Ser Pro Thr Ala Glu His His Pro Glu Asp Thr
1780 1785 1790

Glu Thr Pro Pro Pro Lys Ile Ile Thr Leu Glu Lys Gly Ser Glu Gly
1795 1800 1805

Leu Gly Phe Ser Ile Val Gly Gly Tyr Gly Ser Pro His Gly Asp Leu
1810 1815 1820

Pro Ile Tyr Val Lys Thr Val Phe Ala Lys Gly Ala Ala Ala Asp Asp
825 1830 1835 1840

Gly Arg Leu Lys Arg Gly Asp Gln Ile Leu Ala Val Asn Gly Glu Thr
1845 1850 1855

Leu Glu Gly Val Thr His Glu Gln Ala Val Ala Ile Leu Lys His Gln
1860 1865 1870

Arg Gly Thr Val Thr Leu Thr Val Leu
1875 1880

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Pro Ala Ala Glu Lys Met Gln Val Leu Gln Val Leu Asp Arg Leu Arg
5 10 15 20

gcg ttc tac gag acg ctg aag agc cct ctc ttc aac cag atc ctt aca 260
Ala Phe Tyr Glu Thr Leu Lys Ser Pro Leu Phe Asn Gln Ile Leu Thr
40 45 50

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Gln Ile Leu Thr Leu Gln Gln Ser Ile Lys Gln Leu Lys Gly
50 55 60

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| $\langle 211 \rangle$ | 16 |

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Protein PDZ Domain

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<212> PRT
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Protein

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<212> DNA

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<210> 18
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<210> 19
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<212> DNA

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42

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<212> DNA

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22

<210> 31

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:MMSC1 Primers

<400> 31

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23

<210> 32

<211> 39

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:MMSC1 Primers

<400> 32

gttttcccag tcacgacgtg agctgcttga ggtcaatgg

39

<210> 33

<211> 39

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:MMSC1 Primers

<400> 33

aggaaacagc tatgaccatc taaaggggtcc tggtaatcc

39

<210> 34
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<223> Description of Artificial Sequence:MMSC1 Primers

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39

<210> 35
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<223> Description of Artificial Sequence:MMSC1 Primers

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44

<210> 36
<211> 38
<212> DNA
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<223> Description of Artificial Sequence:MMSC1 Primers

<400> 36
gttttcccag tcacgacgga aatattgaaa gctgtgcc

38

<210> 37
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<223> Description of Artificial Sequence:MMSC1 Primers

<400> 37
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40

<210> 38
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<212> DNA
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<223> Description of Artificial Sequence:MMSC1 Primers

<400> 38
gttttcccag tcacgacgaa agtctttcca ttcccaacaa

40

<210> 39

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<400> 40
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<210> 41
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<212> DNA
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<400> 41
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<210> 42
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<212> DNA
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<210> 43
<211> 40
<212> DNA
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<223> Description of Artificial Sequence:MMSC1 Primers

<400> 43
aggaaacagc tatgaccata aatcttcttg ctccctcctt 40

<210> 44
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<212> DNA
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<220>
<223> Description of Artificial Sequence:MMSC1 Primers

<400> 44
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<210> 45
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<212> DNA
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<400> 45
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<210> 46
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<210> 47
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<210> 48
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<400> 48
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<210> 49
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<400> 49

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<210> 50
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<212> DNA
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<223> Description of Artificial Sequence:MMSC1 Primers

<400> 50
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<210> 51
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<400> 51
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<210> 52
<211> 41
<212> DNA
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<210> 53
<211> 38
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<400> 53
aggaaacagc tatgaccatc tgattgactg catcctcg 38

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gttttcccag tcacgacgca tctgccatta ttaagactgc 40

<210> 55

<211> 41
<212> DNA
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<400> 55
aggaaacagc tatgaccatg tgaagtctgc atctgttgaa t 41

<210> 56
<211> 40
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<400> 56
gttttcccag tcacgacgtc caacaaaagt ctccttcagt 40

<210> 57
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<400> 57
aggaaacagc tatgaccata acctctaata tctggtcacc 40

<210> 58
<211> 39
<212> DNA
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<400> 58
gttttcccag tcacgacgct atagttatcc atgaagtct 39

<210> 59
<211> 38
<212> DNA
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<400> 59
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<210> 60
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<400> 60
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<210> 61
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<400> 61
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<210> 62
<211> 38
<212> DNA
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<400> 62
gttttccag tcacgacggg cctgagcatc gttgggaa 38

<210> 63
<211> 40
<212> DNA
<213> Artificial Sequence

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<223> Description of Artificial Sequence:MMSC1 Primers

<400> 63
aggaaacagc tatgaccata accaggtttt gcaggccagt 40

<210> 64
<211> 39
<212> DNA
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<400> 64
gttttccag tcacgacgtc agggtagtca gcagagtgc 39

<210> 65
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:MMSC1 Primers

<400> 65

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